Additional Policy Guidance to Department of Fish and Wildlife Concerning Wild Salmonid Policy: Fish Population Management Elements

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Goal of Guidance on Wild Salmonid Policy

The goal of the Washington Department of Fish and Wildlife is to protect, restore, and enhance the productivity, production, and diversity of wild salmonids and their ecosystems to sustain ceremonial, subsistence, commercial, and recreational fisheries, non-consumptive fish benefits, and other related cultural and ecological values.

INTRODUCTION AND SUMMARY

1. The Wild Salmonid Policy. On December ___, 1997, the Washington Fish and Wildlife Commission adopted a Wild Salmonid Policy (WSP) that contains goals and management policies concerning wild salmonids that were agreed to by Western Washington Treaty Tribes, and additional policy guidance for Department staff. These documents address many issues, including the harvest, hatchery, genetic, and habitat priorities that are essential for protection and rebuilding of the salmonid resources of Washington State.

2. Using this additional policy guidance. The Wild Salmonid Policy provides the standards and goals to be applied in harvest, genetics, hatchery, and habitat protection programs. Where the Department and all tribes could not reach a common goal or standard, the Department and tribes deferred further agreement and discussion to the particular watersheds and tribal regions. This approach preserves to the Department and tribes the prerogative to provide additional fishery management guidance, directives, or policies that would better address the needs and situations in specific watersheds and regions. Department staff shall use the WSP throughout Washington, including this additional policy guidance where it adds, supplements, and clarifies additional fish population management goals and standards.

3. Using this guidance to work with tribal management of treaty fishing rights. Department staff should be aware that this additional guidance is not endorsed by all tribal governments, although individual tribes may use or support provisions herein. These additional management goals and standards should then be pursued if preceded by review of the relevant facts and management oversight for resolving conflicts with tribal fishery management. In doing so, staff must consider whether applicable court orders affect the Department guidance and consider how the Department can use existing court frameworks and processes to modify and improve protection of wild salmonids through agreed management with tribes. Formal dispute resolution should be instituted only when the Fish Management Program approves such actions after consideration of the WSP and all other appropriate information.

4. Involving citizens and working with other governments. Department staff shall involve public citizens in watersheds as provided herein, and work with Oregon, and interstate and international forums in the manner described.

5. Wild Spawning Escapement. Department staff will review its management and co-management actions to ensure that harvest or hatchery programs do not prevent consistent return of the wild spawners needed to utilize available fish habitat. Department professional staff should use spawning escapement science that is crafted from the observed performance of state and tribal fish managers when they have consistently put adequate numbers of viable wild fish on the spawning grounds over the past two decades. To achieve spawning escapement policies, the Department should be conservative in proportion to the uncertainties that exist in the fish population management process.

6. Use of Incidental Catch Limits. The Department should seek to implement a stock-specific 10% incidental catch limitation for current "primary" stocks when individual annual runs are projected to return at levels below prevailing (and attainable) spawning escapement requirements. The 10% will be calculated in terms of adult equivalents to make its use feasible in chinook salmon management. Past experience and the experience of others show that a specific and objective constraint on incidental catch should be used to ensure proper escapement.

7. Rebuilding populations in hatchery management zones. Current "secondary" stocks will be subject to specific rebuilding strategies. The goal for hatchery fish management areas is to transform these areas into productive wild fish areas using harvest and habitat strategies.

8. Use of marked hatchery fish and selective fisheries. Mass marking and a mixture of non-selective and selective fisheries should be used in future Pacific salmon management. The Department should continue to make use of a hatchery program consistent with other elements of policy and to allow selective fisheries, where a high abundance of hatchery fish will be necessary to insure success. However, future hatchery programs should be made consistent with the needs of wild salmonid populations as described in the WSP.

9. Genetic review of populations. The Department should use quantified genetics-based standards to safeguard the future health of wild salmonid populations. The long-term declines in average size and age composition of many salmon populations have reduced both their reproductive and adaptive potential and their monetary value in the commercial marketplace. The genetically-based minimum spawner abundance numbers described in this policy guidance are not a replacement for MSY escapement objectives. Instead, these minimum spawner numbers are intended only to protect the genetic material of locally adapted populations, not as a substitute for ensuring use of available habitat or for protecting small populations from risks of natural mortalities that take increased percentages of smaller populations and create risks of extinction. Stock transfers and the breeding of hatchery fish in the wild should be controlled to promote local adaptation and to maximize the productivity of wild populations.

ADDITIONAL POLICY GUIDANCE

General Overview for Addressing Wild Salmonid Recovery through Fish Population Management

The Wild Salmonid Policy, including this additional policy guidance, should be used to promote recovery of wild salmon populations in Washington. This section briefly reviews five types of fish management challenges that the Department will face as it works in coordination with tribes, other governments, and citizens:

- A total of 89 Pacific salmon populations are currently being overfished, or may be subject to overfishing, as a result of their harvest in what have been called hatchery management zones. Many of these practices were established in the late 1970s by the Department of Fisheries itself. To eliminate the practice, adipose fin marking of hatchery fish will be a priority, in concert with compliance with the Wild Salmonid Policy.

- Salmon and steelhead populations in the upper Columbia River cannot replace themselves due mainly to the extensive series of dams and reservoirs. Drastic reduction of mortalities caused by dams remains the highest priority for addressing this problem.

- Wild runs have been overfished even when the putative policy was to put adequate numbers of viable wild fish on the spawning grounds. The priority for these situations will be to review and implement the Wild Salmonid Policy that is designed to achieve appropriate escapement.

- The productivity of wild salmonid populations in some locations has been reduced due to excessive ecological and genetic interactions between wild and hatchery-origin fish.

- There are many case histories of successful past management with the state's salmon, steelhead, sea-run cutthroat, resident trout and char resources. These practices should be continued in the future.

When the Department addresses these five fishery management situations, the Wild Salmonid Policy should result in the following framework:

1. The Department, in cooperation with affected tribes, will conduct an assessment of each wild stock that has a past history of being overfished and take one of the following steps:

    - If a stock is too small to recover naturally, then temporary artificial production intervention will be necessary. Control of harvest will be phased in as returning adults become available.
    - If existing wild population is deemed capable of effectively rebuilding itself, then a planned rebuilding schedule will be developed and implemented.
    - Both of the above should involve a meaningful public input process and compliance with all planning and co-management obligations with affected Tribes. The terms of specific plans will supersede the more general 10% incidental harvest impact limitation.

2. The Department will continue artificial production consistent with applicable law and policies for a wild stock that is not capable of replacing itself.

3. Where a former "Primary" wild stock has been seriously overfished, the Department will manage to hold incidental catch levels in Washington fisheries to a total of 10% until the stock is rebuilt or the stock becomes subject to a specific rebuilding plan consistent with Department policies.

4. To address interactions between wild and hatchery-origin fish, the Department will seek to improve homing of adults back to release locations and reduce breeding in the wild, use differential harvest rates on wild and hatchery fish, and use the proper amount of hatchery fish to promote escapement and local adaptation by wild populations.

5. No change is required for a wild stock that has consistently had spawning escapements at or above the point estimate of MSY.

Description of Legal Authority for Wild Salmonid Policy and Use of this Additional Policy Guidance

The Department staff must use the Wild Salmonid Policy within the scope of the Department's legal authority and responsibilities. This section guides the Department on proper use of the Wild Salmonid Policy (including this guidance) on implementing the policy.

1. The Wild Salmonid Policy shall guide and direct the Washington Department of Fish and Wildlife (the Department) on matters of salmonid population management, including harvest management, genetic protection, and hatchery operations. It is issued by the Commission pursuant to authority under Titles 75 and 77 RCW, chapter 43.300 RCW, the State Environmental Policy Act (SEPA), and the Administrative Procedure Act (APA). It will be used to guide implementation of Department legal authorities and to comply with other existing law, including federal law.

2. The Wild Salmonid Policy is intended to be consistent with existing law. This Policy shall guide the Department's implementation of existing statutes, regulations, and other legal responsibilities. If amendment of statute, regulation, court order, or applicable law is needed to implement the Policy, then staff shall use the Policy to propose appropriate changes.

3. The Wild Salmonid Policy addresses specific Department and Tribal actions and does not directly regulate actions of other state agencies, federal, tribal, or local governments, or any private parties. The Department and Tribes may use the WSP to guide their interactions with other public and private entities. Of course, existing and future Department regulations have the normal effect of law.

4. The Wild Salmonid Policy does not diminish any legally enforceable rights, substantive or procedural, granted by existing law. The Department staff should scrupulously comply with requirements of SEPA and the State Regulatory Fairness Act.

5. The Wild Salmonid Policy is not intended to alter, amend, or modify any Indian treaty rights or any court order that implements treaty rights to take fish. When this policy guides Department activities that affect (or may affect) treaty fishing rights, then the Department shall comply with all applicable court orders and processes, including but not limited to the 1989 Centennial Accord with Washington Indian Tribes and the joint Wild Salmonid Policy adopted by the Department and the Western Washington Treaty Tribes, so that management decisions are made in a cooperative manner with fair attempts to resolve or identify disputes over such management. Within this context, the Department shall pursue the Wild Salmonid Policy, together with this guidance, and seek cooperative management decisions with the tribal governments that are consistent with the spirit and purpose of the WSP and other Department authority.

6. Implementation of the Wild Salmonid Policy is subject to the powers of the Legislature to appropriate moneys and provide powers to the Department. Where Legislative action affects implementation of the WSP, the Commission may provide additional guidance.

7. The Policy is not intended to supersede or modify existing agreements, contracts, or consent decrees. However, the Department and Tribes may seek modification of agreements, contracts, or decrees by negotiation, agreement, or other appropriate means. In doing so, the Department staff should seek changes that will further implement the WSP.

Guidance for Implementation of Wild Salmonid Policy in Coordination with Other Governments and Citizens.

This section addresses public involvement and how the Department should work cooperatively with other governments. The Department shall use public outreach and input in all areas of the state to address salmonid management issues. Public understanding of Department policies is essential to meeting the goal stated above.

The Department shall cooperate and plan with other governments to incorporate policy goals and to implement action strategies in situations where the Department shares management authorities and responsibilities. This requires co-managment of salmon fisheries using a government-to-government relationship with individual Indian tribes. Other interjurisdictional relationships include: shared authorities with the State of Oregon on the Columbia River (e.g., Columbia River Compact); multi-state/tribal involvement with regard to salmon and steelhead resources originating in the Columbia River basin above Bonneville Dam; and state, tribal and federal interactions through PFMC and Pacific Salmon Treaty management.

Public outreach and working with other governments create different implementation requirements that will be best addressed if Department staff seek both the spirit of this guidance and the spirit of all legal requirements for public participation and intergovernmental relations.

1. **Implementation shall incorporate a high level of public involvement and collaboration with constituents that have a high interest or stake in the outcome of actions guided by the policy.**

The Department will use local and statewide citizen involvement to achieve the underlying resource protection and restoration intent of the Wild Salmonid Policies and this guidance. It should recognize the importance of citizen volunteers and advocates in this process. Implementing significant change will ***not*** be simple. The Department should place a priority on public involvement to communicate, educate, analyze, plan, implement, and evaluate, as well as the formal obligations of the Department such as SEPA and the State Regulatory Fairness Act.

The Department will use the following procedures to ensure public involvement and input helps guide its implement of the Wild Salmonid Policies:

1.1. The Department will use citizen advisory groups to provide feedback on fish management issues. These include, but are not limited to, the Commercial Fishery Advisory Group, the Anadromous and Marine Recreational Fishery Advisory Group, the Inland Fish Policy Advisory Group, the Puget Sound Recreational Fishery Enhancement Oversight Committee, and the Steelhead and Sea-Run Cutthroat Citizens Advisory Group.

1.2. The Department will develop annual management guidelines or reports for Commission review, and to guide annual salmon management planning through the "North of Falcon" process and subsequent in-season implementation. Such guidelines will be consistent with law and consider input from appropriate advisory groups. The Commission's normal public meeting and comment process will be used for oversight of such reports and public input.

1.3. The Department will review and improve annual salmon management planning processes to ensure public understanding of the process and allow meaningful input:

- Annual North of Falcon discussions with non-Indian fishery constituents will begin earlier as appropriate to scope, discuss and plan new fishery approaches (e.g., selective fisheries for marked coho).
- Regional fishery planning meetings held during the pre-season window will be considered to be “formal adjuncts” of the North of Falcon process and will be publicly announced to ensure that both local and non-local constituents have an opportunity to meet and share their interests together and so that input from these meetings can directly advise agency staff.
- North of Falcon meetings will be planned and scheduled to enhance open and effective communication with tribal managers *and* to serve as the annual public hearing process for inside commercial fishery rule adoption for coastal and Puget Sound salmon fisheries.
- Documentation of annual planning outcomes will be strengthened to improve process accountability.

1.4. Where needed to supplement existing advisory groups and watershed groups, the Department will develop new regional salmonid management planning groups to assist review and definition of management strategies. This applies to both anadromous and resident species planning.

- Regional staff will take the lead in organizing and facilitating these forums, while Fish Management Program policy staff will provide policy support as appropriate to provide guidance, compliance with applicable policy and law, and consistency across regions.
- Priority planning attention will be given to those areas where management intent is most likely to change and/or where resource needs are highest.
- The Department will compare current objectives and approaches with desired outcomes to write action plans.
- The Department will use regional groups to develop options for fishery and hatchery management strategies that meet Department legal authority and policy, while achieving the resource protection policies and creating sustainable fishery benefits.

2. **Department staff shall use cooperative management that recognizes the government-to-government relationship with individual Indian tribes. This should be a central fixture in reviewing and revising, as appropriate, salmon and steelhead management objectives consistent with treaty rights to take fish as created by federal authority and implemented by relevant court orders.**

The Department shall recognize that the management of salmonid fisheries with treaty tribes or other tribal governments depends on mutual respect and cooperative management where the parties use their independent sovereign powers jointly to protect wild salmonids and generate sustainable benefits. This means that the Department must recognize both the complex legal relationship and existing court orders and frameworks that have evolved to address cooperation in management, as well as the WSP. Where the Department seeks changes to existing judicially controlled fishery management, the Department shall ensure the proper oversight and participation of policy level management, such as the Assistant Directors of the Department, program management, and the Tribal Policy Coordinator and Interjurisdictional management program. At all times, the Department must use good faith attempts to resolve disputes over such management and recognize that the policy goals of the Department should be demonstrated and appropriately designed to recognize treaty fishing rights. The following strategies will be used:

2.1. The **Fish and Wildlife Commission** will intermittently meet with tribal policy leaders to broadly review the status of the state/tribal cooperative management, develop joint strategic goals, and discuss policy issues and opportunities of mutual interest.

2.2. The **Director's Office** will maintain regular communication with Tribal governments to ensure progress toward shared strategic goals and objectives. A Tribal Policy Coordinator will report to the Director's Office to assist and facilitate this mission. The

Director's Office has the authority to negotiate agreements with tribal governments and resolve management disputes that may occur. This authority may be delegated to resource programs to ensure timely and responsive cooperative management with the tribes.

2.3. The **Assistant Directors** and designees of resource programs will provide policy administration in management activities with the Tribes including:

- active participation and leadership in statewide and higher level regional management issues.
- providing support and guidance for development of basin watershed plans to the Regions with Regional Fish Program Managers.

2.4. **Regions** will have the responsibility, with any appropriate policy support noted above, to develop and implement watershed plans with affected Tribes.

- appropriate planning priorities and joint work plans with affected Tribes will develop a cooperative agenda consistent with available resources.
- management and technical work teams may be used to facilitate effective review, development, and implementation of basin management plans.
- development of any state/tribal management plans will accommodate and incorporate appropriate involvement and contribution from other managers and interested stakeholders (see guidance on public involvement). Department staff should work with the tribes to afford opportunities for potentially affected constituents to observe state/tribal management discussions directly and to enhance their understanding of fishery management.

2.5. Department staff shall seek to implement the WSP cooperatively with affected Tribes by observing existing court-mandated planning processes, by following the WSP, and by seeking to jointly review, modify, or develop plans. **Where potential differences** in state and tribal perspectives exist, the Department will:

- seek to develop agreement on long-term management actions that are consistent with the Wild Salmonid Policy.
- explore implementation plans and creative strategies that meet Department policies in a defined predictable manner.
- seek to resolve scientific uncertainties quickly through specific evaluation and decision making plans and frameworks.
- jointly seek scientific peer review to assist resolution of potential differences where appropriate.

3. **Cooperative management approaches will be pursued with the Oregon Department of Fish and Wildlife in areas of shared authority to ensure joint adoption of management objectives and strategies. Where this shared jurisdiction includes treaty Indian Tribes and Idaho, the combined implementation intent in sections 2 and 3 above apply.**

   3.1. Department staff will engage ODFW counterparts to review and modify, as appropriate, basic spawner escapement and management policy, including use of hatchery production strategies, to meet policy intent. Where potential differences in WDFW and ODFW perspectives may occur, the Department will:

   - seek to develop shared long-term management goals consistent with the WSP.
   - explore implementation plans and creative strategies that will meet long-term objectives in a defined and predictable manner while addressing short-term issues.
   - seek to resolve scientific uncertainties through specific evaluation and decision making processes.
   - jointly seek scientific peer review to assist resolution of potential differences where appropriate.

   3.2. Discussion and review will occur as an additional context to annual fishery and production planning. The Department will:

   - review in-river management plans and agreements.
   - review salmonid harvest objectives and strategies that target hatchery fish.
   - develop joint work plans and management plans as appropriate.
   - collaborate on management innovations that will increase resource protection effectiveness while limiting short-term disruptions to fishery benefits.
   - work with ODFW to recognize and accommodate its internal planning requirements to ensure effectiveness of joint work.

4. **The Department will** p**rovide leadership within PFMC and PSC management forums to ensure effective integration of the policy's management intent and guidelines into MFCMA and international management plans and actions.**

   4.1. Department staff will actively participate in formal policy and technical roles in these forums to:

   - share and incorporate desired management goals and objectives.
   - effectively negotiate reductions in Canadian exploitation rates on Washington-origin salmon stocks, especially chinook and coho.
   - develop joint management planning and approaches for new initiatives (e.g., mass marking and selective fisheries) to ensure domestic management success.
   - recognize process timelines to develop effective workplans to effect change.

4.2. Department will develop cooperative efforts and strategies among domestic management entities to maximize success in these forums.

4.3. Department will review and shape federally proposed management objectives and strategies to achieve consistency with policy intent.

Additional Guidance for Spawning Escapement Policies

The Wild Salmonid Policy for spawner escapement is broad and encompasses differing policy positions of tribes, impacts of past court decisions or plans, but provides an opportunity and direction for improving escapement requirements in different watersheds. Within this broader context, the Department staff should seek to implement objective and principled spawner escapement standards both in planning with affected tribes under the WSP and in all other areas of the State. The following guidance is intended to provide such additional objective standards and principles for Department spawner escapement work:

1. Department staff should establish spawner abundance goals for individual, separate breeding populations (stocks) in all areas that have existing or restorable habitat capacity to support naturally reproducing, self-sustaining stocks. The intent of such goals will be to encourage local adaptation (high productivity) and maximize surplus production that sustains harvest, recreational opportunities, and ecological benefits.

2. Future fishery management and spawner escapement goals should be based on the needs of individual stocks. These are the basic building blocks that constitute the state's salmonid resource. Combining individual wild populations into management units may lead to excessive harvest on the individual populations and staff should address and avoid such impacts.

3. All salmonid populations should be managed to meet or exceed MSY escapement on a consistent, predictable basis. The following guidance for application of MSY was derived from actual approaches used in the past by managers that have consistently put adequate numbers of viable wild fish on the spawning grounds. It is based upon the successful case histories where managers have fully accounted for uncertainties by being conservative in both the spawning escapement goal itself and in subsequent fishery management planning.

A. Guidance for Application of MSY (or MSH):

1. The quantitative analysis work for salmon and steelhead should be anchored in the scientific concept of MSY. The best possible data for determining MSY comes from a long time series of accurate spawner and recruit statistics for each population. In other words, the ideal situation is where the fish themselves tell you their precise relationship with no requirement for critical assumptions that cannot be verified. In reality, two adjustments are essential for correct application. There will be varying degrees of uncertainty associated with each spawner-recruit relationship. This level of risk to the resource must be quantified and added to the point estimate of MSY.

2. Fishery managers can change to a different, more conservative fishing strategy. This could be a different methodology for establishing a basic escapement requirement (e.g., historical production or habitat availability) or an accommodation for emerging scientific evidence of broader ecosystem benefits. A second risk adjustment must be made for expected level of harvest management precision. The desired end result for each population is the consistent delivery of fully adequate (or greater) numbers of viable wild fish to the spawning grounds.

3. Only fish whose parents spawned in the wild should be counted toward meeting the spawner abundance goals. The exception to this guidance is where a formal supplementation program has been established (or where existing law requires otherwise and has not been changed by agreement or subsequent proceedings). Further, Department staff may count locally-adapted hatchery-origin fish toward meeting natural spawning escapement objectives if there is empirical evidence that hatchery fish spawning in the wild had the same short- and long-term reproductive performance as wild fish. To count, fish must meet all of the following criteria:

   a. distribution throughout the watershed area normally used by the wild population;
   b. matching the genetic profile, size, age and run timing characteristics developed by the wild population in its evolutionary history; and
   c. yielding progeny with survival rates and population dynamics comparable to the wild population.

   Note: These characteristics are critical for populations limited primarily by spawning habitat as well as for populations with extended juvenile freshwater rearing that depend upon downstream dispersal of fry to seed available habitats. The above criteria are not a basis for a broad production and management strategy.1

B. Additional Implementation Guidance for Fishery Managers

1. For salmon and steelhead, managers must recognize the practical realities of fishery management. In many cases, two or more co-mingled and closely-related wild stocks of the same species and run timing must be managed in the same terminal area fishery. The key expectation is that those co-mingled stocks can reasonably be anticipated to have similar freshwater and marine survival rates during each individual generation. Managers must set escapement objectives that are proportional to the existing productivities of similar stocks. The fish themselves can best provide the needed information in terms of quantitative abundance measures for each population. The human managers must be successful interpreters of these data. Failures will lead to the same practical problems that have occurred in the past; i.e., poorly-based escapement objectives that lead to impossible fishery management situations.

2. Managers must also watch carefully for real declines or increases in habitat productivity as they affect individual populations. When necessary, escapement objectives must be adjusted accordingly to reflect these changes. This would be in addition to other measures taken to reverse decreases in

1 It is anticipated that only a few fish culture production projects (i.e., Lake Washington sockeye mitigation hatchery for Landsburg Dam as it is designed) will be able to meet these criteria. Projects meeting these criteria will not be expected to meet the gene flow standards until it is technically feasible to mark fish externally and then selectively fish the resultant progeny. These situations would be the exception compared to the number of wild stocks of that species that do not have hatchery fish reproducing in the wild.

habitat productivity.

3. For other resident and anadromous trout and char, fishery management measures will require approaches ranging from wild fish release to slot limits to the following intent described by Wright (1992, p. 524)2: "The management approach that provides for some continued consumptive harvest is to set the minimum size limit at a level that will allow a full age-class of females to spawn at least once and thus ensure maintenance of a population's reproductive potential. For example, if only 20% of the females spawn at age 3 but a majority (over 50%) spawns by age 4 then the minimum size limit needs to be set at the upper end of the length-frequency distribution of age-4 females. Males typically mature when they are somewhat younger, thus any regulation geared to females will also produce adequate male spawners. This size distribution needs to be that which would be projected to occur at the end of the fishing season. Trout will be continually growing during a spring-to-fall fishing season and the effect of any minimum size limit will be continually shifting. In our planning, we elected to protect a full age-class of female spawners in order to reduce the potential for selective fishing pressure."

4. Future uses of slot limits should also consider the following guidelines, Wright (1992, p. 525):

"The one inherent danger with a slot limit is the uncertainty about whether adequate recruitment can be consistently achieved and sustained whenever a block of immature trout is subjected to consumptive harvest. A good monitoring program would be essential with this type of fishery. It is better suited for more productive waters with those species that are harder to catch. Brown trout in Wyoming are a good example. A future expectation of only a moderate annual fishing mortality rate is also essential."

Additional Guidance for Conserving Genetic Diversity

1. The joint agreement on Wild Salmonid Policy states that the selective effects of fisheries on population attributes for Pacific salmon will be carefully managed to insure that population characteristics such as adult size, timing and distribution of population migration and spawning, and age at maturity remain similar between the fished and unfished portions of the population. While respecting the agreed policy and considering additional tribal policies, Department staff should seek to make such population characteristics remain the same between the fished and unfished portions of the population when that is within the authority of the Department. This means that the population will not be changing over time as the result of harvest influences, and where changes have occurred in the past due to fishing pressure, the population should be changing back to a more natural pattern in response to natural adaptation. For the remaining salmonids that have multiple spawning capabilities, the primary goal will be to prevent any significant shift to sexual maturity at a smaller size or age.

2. The genetic criteria are one of two important policy elements that are essential to insuring perpetuation of individual, separate breeding populations (stocks). However, the greatest danger with a small stock size occurs when predation or disease leads to a situation where the highest percent mortality occurs at low abundances of juvenile or adult salmonids (see Appendix D of FEIS).

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2 Wright, S. 1992. Guidelines for selecting regulations to manage open-access fisheries for natural populations of anadromous and resident trout in stream habitats. North American Journal of Fisheries Management 12:517-527.

3. Sanctuaries, or refuges, will be established where populations can be protected from most of the effects of habitat, harvest and hatchery influences. It will not be possible to protect populations from all of these influences all the time, but it will be possible for some populations to be largely protected from many of these influences. These protected populations serve two important functions: (1) they provide a comparison for measuring the changes in unprotected populations so that we can see the impacts of our actions, and (2) are a source of fish if a neighboring population is changed too much to recover naturally.

A. Guidance for Implementing Genetic Abundance Levels

Department staff should seek to have each individual stock maintain a minimum base level abundance of 3,000 fish. The 3,000 base level is for a population that spawns a single time and at a single age (e.g., pink salmon). Table 1 describes how this base level would be adjusted for other species and spawning types. Where the population at abundant habitat utilization is less than 3,000, steps to improve the amount or quality of the habitat should be taken to bring the population up to the minimum level.

Table 1. Minimum spawning populations needed to maintain genetic diversity and local adaptation for various spawning types and life histories.

Spawning Type	Life History	Typical Species	Rule for Calculating Desired Harmonic Mean Number of Spawners
1	No repeat spawning; Spawners a single age	Pink salmon	3,000 (no calculations involved)
2	No repeat spawning; Spawners multiple ages	Chinook, coho, chum, and sockeye salmon; steelhead[1]	3,000 divided by the average age of the spawners[2]
3	Repeat spawning; Spawners multiple ages.	Rainbow, cutthroat, Dolly Varden, Bull trout, and pygmy and mountain whitefish.	3,000 divided by the average age of the spawners[2] minus 1

[1] Steelhead are technically repeat spawners, but repeat spawning in Washington is at a low level compared to type 3 spawners, so they are more appropriately included here.

[2] Mean of the average age of the two sexes.

For other smaller populations (less than 3,000 actual or potential), the standard shall apply to the smallest localized aggregation of similar stocks that will meet this standard in terms of actual or potential production.

B. Guidance Regarding Allowable Gene Flow.

Table 2. Allowable percentages of hatchery fish on the spawning grounds.

Level of Similarity of Hatchery Fish	Maximum % of the Wild Spawning Population That Is of Hatchery Origin
High	5-10%
Intermediate	1-5%
Low	0-1%

Human caused gene flow between species, major ancestral lineages, genetic diversity units, or stocks through direct transfer of fish across stock or other boundaries should not be allowed. This will require the development of local broodstocks for many hatchery and other enhancement programs. Where there is no supplementation program in place, the allowable percentage of the total wild spawning population that is made up of fish raised in a hatchery is given in Table 2. For supplementation programs of hatchery-origin fish, proportions of hatchery fish would be decided on a case-by-case basis. These percentages of hatchery fish in Table 2 are surrogates for and are equal to allowable gene flow. Other measures of potential gene flow may be used (e.g., migrants per generation), if they result in similar levels of potential gene flow. Where treaty fisheries are affected, the Department should address gene flow within the brood stock planning framework with affected tribes.

This policy uses the stricter definition of similarity that compares the hatchery fish with an ideal locally adapted wild fish. This maintains a higher level of local adaptation in populations that are already locally adapted, and increases the rate at which a hatchery influenced wild population becomes locally adapted. Similarity is determined based on the geographical origin, hatchery history, and hatchery practices that have affected the hatchery fish. In a hatchery population with high similarity, the hatchery fish will be of local wild stock origin and have few generations in the hatchery. There will be regular introductions of new wild broodstock into the hatchery population and the hatchery rearing conditions will be similar to wild conditions. Time spent in the hatchery will be limited and strict spawning guidelines will be followed. A highly similar stock will need to pass all these tests. A low similarity hatchery population will have many generations in the hatchery. There may have been selection for timing or size and the population may have been at very low numbers at times. There are few introductions of wild fish or it may have been started with non-local fish. A low similarity stock will have to meet only one of these criteria. Intermediate stocks exceed all the low criteria, but fail to meet at least one of the high criteria. Most current hatchery populations will be either low or medium similarity.

Hatchery fish spawning in the wild should be controlled and limited so that the majority of stocks in a major watershed, river basin, or GDU do not have any hatchery gene flow, and so that the higher maximum percentages of hatchery fish on the wild spawning grounds noted are exceptions (i.e., occur infrequently and not in the most abundant or most unique components of the larger population groupings).

Department staff should emphasize use of broodstock in fish culture operations that are locally adapted and highly similar to the wild stocks in that area. In some cases, however, it is better to use broodstocks that have been selectively bred or are adapted to cultured conditions. Such existing programs are the rainbow trout strains used for the stocking of lakes and the use of early-time returning winter steelhead. Using hatchery adapted fish where gene flow and ecological interactions with wild stocks can be

controlled (is essentially zero) is a recognized and valid management tool.

Additional Guidance for Ecological Interactions

1. The Department and Tribes share a policy that actions will be taken to minimize risk to wild stocks from interactions with cultured production, which will be estimated for each species within individual regions. Department staff should recognize that flexibility in using hatchery program should be directed towards designing hatchery programs that have no significant negative impact on wild stocks.

2. Department staff should not introduce salmonids into areas where they did not historically exist, except where an ecological risk assessment determines there would be no negative impacts from such introduction.

A. Guidance for Resolving Conflicts Between and Within Species and Stocks

To resolve species and stock conflicts, guiding principles should be stock origin, stock status, and the relative value of different stocks. Any management action directed at one stock that has the potential to affect other salmonids should be examined using the three stock priority criteria.

1. Stock Origin Guiding Principles:

   - The highest priority for management of wild fish is resource protection of native stocks.
   - Locally adapted stocks are of a higher priority than newly introduced stocks.
   - The priority for management of exotic species is primarily to provide fishery benefits, within the guidelines of sound management principles that also protect native species.

2. These principles result in the following stock priorities:

   Highest Priority - Native stocks - populations that are relatively unchanged from before statehood which utilize their original habitat.

   Second Highest Priority - Mixed origin stocks - populations originating from native and non-native stocks; or a previously native stock that may have undergone substantial genetic alteration.

   Third Highest Priority - Non-native stocks - populations from a native species that are outside their original habitat.

   Fourth Highest Priority - Exotic stocks - stocks originating from outside Washington of species native to Washington.

   Lowest Priority - Exotic species - species that are not native to Washington.

3. Stock Status Guiding Principles:

   - Critical and Endangered status stocks or species have the highest priority in terms of stock protection actions, to reduce the risk of extinction. It is also very important (especially more

cost effective) to protect existing healthy stocks. Prioritization will involve balancing these two important issues.

- Depressed and Threatened status stocks or species have a high priority in terms of stock protection actions, to restore them to Healthy status. Stocks rated Unknown will be managed conservatively until their status is determined. Higher priority will be given to those stocks that provide the greatest level of benefits or value. These include the full range of economic, social, ecological, cultural, and other values. Native stocks and established indigenous stocks should be maintained at self-sustaining levels. The recovery of Critical, Endangered, Depressed, and Threatened stocks or species should not be jeopardized or negatively affected.

Additional Guidance for Harvest Management Policies

1. Department staff should use available management authority to limit incidental harvest impact to 10% of the Washington stock abundance. This should be done with respect to the implementation guidance for working with tribal government. The 10% limit allows opportunity to structure fishing opportunities on more abundant and productive stocks. This 10% allowance is a maximum and shall be adjusted downward to zero depending on how far a stock is below its spawner abundance goal.

2. This 10% limitation shall be computed in terms of adult equivalents and shall include all known sources of fishery-induced mortality. Precocious males, commonly called "jacks," shall be excluded from the calculation.

3. This 10% limitation applies only to a current "primary" population projected to return below the desired spawner abundance level (see also *General Overview for Addressing Wild Salmonid Recovery Through Fish Population Management*, above).

4. Where a stock is not meeting its desired spawner abundance level, the State, in managing the non-treaty harvest and otherwise complying with applicable law, should give priority to those fisheries that can minimize their impacts on weak stocks and increase their harvest on healthy stocks by: (1) using gears that can selectively capture and release stocks with minimal mortality; or (2) avoid impacts by eliminating encounters with weak populations (proven time/area closures, gear types).

Additional Guidance for Cultured Production/Hatcheries Policies

1. While complying with applicable court orders, the Department shall encourage marking of all hatchery-origin juvenile anadromous fish by removal of adipose fins, prior to release in state waters. Specific exemptions may be provided on a case-by-case basis for (1) broodstock development or maintenance, (2) difficult treaty Indian allocation problems that cannot be resolved by other methods, or (3) valid wild stock supplementation programs.

2. In order to accommodate emerging technology, proven alternative mass marking techniques may be

utilized for pink, chum and sockeye salmon.

3. Gene banking should be used only where the natural environment cannot sustain a population, and until these factors can be corrected.

4. Supplementation should be limited to situations where: (1) a stock is well below desired levels and it cannot rebuild itself due to some cause other than overfishing; (2) a stock is being reintroduced to an area it formerly occupied; and (3) the risks of potential stock loss through extinction are greater than the genetic risks due to gene flow or the extinction risks due to the supplementation process itself. Supplementation will be primarily directed at efforts where the conditions causing the problem are being corrected so that the population will eventually become self-sustaining. Figure 1 explains further:

Figure 1

WILD SALMONID POPULATIONS AND ARTIFICIAL PRODUCTION INTERVENTION

1 Existing wild salmonid population has demonstrated the capability to replace itself on a sustainable basis..	⟹	Intervention limited to harvest augmentation only. Adipose-fin mark, and no reliance for natural spawning augmentation.
2. Existing wild salmonid population does not presently have a demonstrated ability to replace itself on a sustainable basis.	⟹	Intervention has the primary objective of providing effective naturally spawning fish. May be adipose-fin marked.
3. Historic wild salmonid population no longer exists OR is too small to recover naturally following a fishery management action or habitat capability change.	⟹	Intervention is temporary only for the specific objective of re-establishing natural selection processes. Intended result is a population capable of replacing itself on a sustainable basis.

Guidance for Implementing Selective Salmon Fishing Strategies

One of the most important missions of this policy is solution of a fishing rate problem for Pacific salmon. The basic dilemma confronting today's managers is a mixture of hatchery fish, which can typically support overall fishing rates of 90% or more, and wild fish, which must be limited to average fishing rates of 50-60%. The policy elements described are intended to continue and expand all status quo fisheries and techniques for targeting fishing effort on hatchery fish except for the common practice of deliberately overfishing wild salmon populations.

New strategy elements that will lead to the desired end-product of 90% harvest rates on hatchery salmon and 50-60% average harvest rates on wild salmon are as follows:

1. The selective fishery option will be provided by adipose marking most hatchery salmon. This will parallel the established practice with steelhead throughout the Pacific Northwest and British Columbia, which has prevented deliberate overfishing of wild fish from ever being adopted as a basic policy in steelhead management. Selective fishing on either salmon or steelhead is always an alternative to closures, not continued regular non-selective fisheries.

   Conceptually, the ideal situation for selective fishing is to have any relatively inefficient fisheries

occur “first in line” in terms of fishing on the entire salmonid population. The existing sport and troll salmon fisheries in marine waters of Washington are relatively inefficient as compared to the commercial net fisheries that occur later in time on the same salmon populations. Thus, the make-up of existing fisheries is ideal for salmon since the sport and troll fisheries will be fishing on the entire population of salmon in Washington waters. The existing situation for steelhead is less ideal. The less efficient selective recreational fishery commonly occurs after the more efficient regular treaty Indian net fishery. It has proven to be workable in actual practice.

2. While hook-and-line gear and existing commercial gear types such as purse seines, reef nets, and beach seines are adaptable to selective fishing (wild fish release), gill net gear is not. However, fish managers have flexibility to use a mixture of regular and selective fisheries to yield the desired overall end-result of 90% versus 50-60% average fishing rates. Gill net gear will likely remain a major component of the regular category in the future (both Treaty Indian and non-treaty commercial).

3. Additional fishing opportunities can be provided to today’s gill net fishermen and other user groups by two basic management techniques. First, off-site, pen-reared releases of hatchery salmon allow selectively higher hatchery fish harvests. In mixed-stock harvest areas of Alaska, fishing rates are set for wild stocks; the hatchery surpluses are harvested in carefully controlled sport, troll and net terminal fisheries at the release sites. Programs of this type have already been implemented in several Washington and Columbia River areas.

4. It is also important to develop new commercial gear capable of selectively harvesting hatchery fish while still safely releasing wild fish. Emphasis should be on types of nets that can be used by existing fishermen with existing small (gill net) boats. Fish traps and fish wheels have been proposed for decades as alternative gear types. However, these proposals have never received any serious consideration since they are correctly viewed as potentially threatening replacements for traditional fisheries. The key for future success is to target fishing gear development that will work well for experienced fishermen with substantial investments in their boats.

For additional information:

Washington Department of Fish and Wildlife. 1997. ***FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE WILD SALMONID POLICY***. Washington Department of Fish and Wildlife. Olympia, Washington.

The FEIS, adopted in September 1997, provides a substantial discussion of fish management policy alternatives and cites numerous studies used to develop the fish population management sections of the Wild Salmonid Policy and this additional guidance on implementation of the WSP.